# ECE421: Assignment 03

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## Problem 1

**Part 1:**

Points:

$$x^{(1)} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}, x^{(2)} = \begin{bmatrix} -1 \\ -1 \end{bmatrix}, x^{(3)} = \begin{bmatrix} 1 \\ 0 \end{bmatrix}, x^{(4)} = \begin{bmatrix} 0 \\ 1 \end{bmatrix} \tag{1}$$

$$t^{(1)} = 1, t^{(2)} = -1, t^{(3)} = -1, t^{(4)} = -1 \tag{2}$$

Graph:

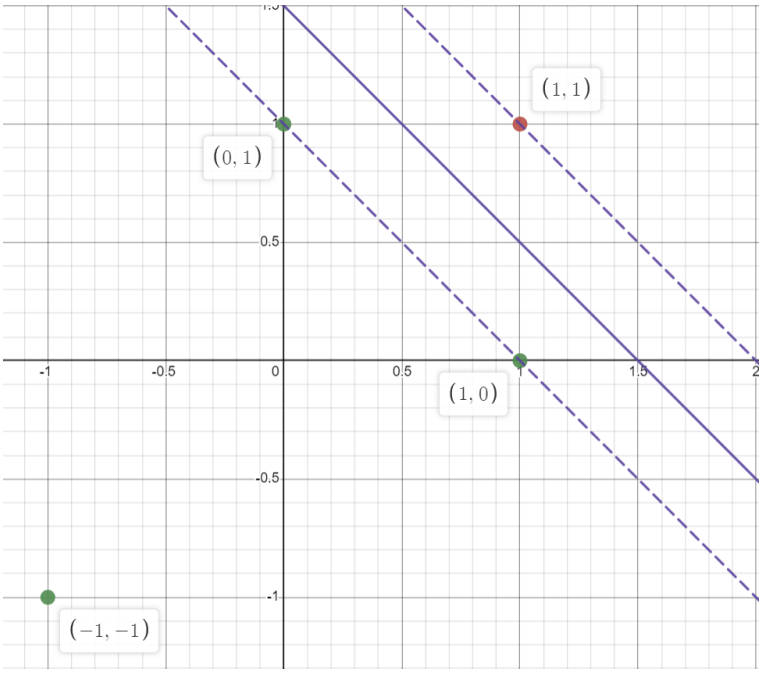


Figure 1: Plot of the points

The equation for the decision boundary is: $y = -x + 1.5$. And the equation for the margins are: $y = -x + 1.5 \pm 0.5$.

**Part 2:**

From the above figure 1, we can see that the support vectors are $x^{(1)}$, $x^{(3)}$, and $x^{(4)}$.

**Part 3:**